

ART. XI.—*A New Gavial from the Late Tertiary of Florida*; by E. H. SELLARDS.

THE crocodilian remains described in this paper, including the anterior part of a cranium and part of a lower jaw, were obtained by Mr. Anton Schneider, general manager of the Amalgamated Phosphate Company, and were by him presented to the Florida State Geological Survey. The specimens are from the Company's mine at Brewster, Polk County, Florida, and were obtained in mining phosphate rock. The deposits in which the fossils are found, the Bone Valley formation, are either of upper Miocene or of lower Pliocene age. The associated fossils, although not fully studied, are known to include rhinoceroses, probably *Teleoceras fossiger* and one or two other species, one or two species of *Hipparion*, and one or two species of mastodons, including apparently the form described as *Mastodon floridanus* by Leidy. Fish and cetacean remains as well as crocodilian teeth are present, the deposits being of shallow water, marine or estuarine origin.

Of the Eusuchia, the sub-order to which is referred some of the late Mesozoic and all of the Cenozoic and recent Crocodylia, four families are recognized as follows: Alligatoridæ, Crocodylidæ, Tomistomidæ and Gavialidæ.* Of these families, the Alligatoridæ and the Crocodylidæ include, with some exceptions among the crocodiles, short snouted species, while the Tomistomidæ and Gavialidæ include long snouted forms. Further distinctions are found in the lower jaw, the symphysis of which, in the Alligatoridæ and Crocodylidæ, is short, never extending according to Gadow beyond the eighth tooth, while in the Tomistomidæ and Gavialidæ the symphysis is long never stopping short of the fifteenth tooth.

That the species described in this paper is to be placed with the gavials rather than with the crocodiles is indicated not only by the long snout and extended symphysis of the lower jaw, but also by the fact that the first mandibular tooth bites on the outside and not on the inside of the upper jaw.

Between the Tomistomidæ and the Gavialidæ distinctive characters are found in the relative extent of the nasals. In the Tomistomidæ the nasals are long and narrow and articulate with the premaxillaries, while in the Gavialidæ these bones are remotely separated from the premaxillaries, from which they are shut off by the maxillaries. Although of the skull only the rostrum is preserved in the Florida material, the position of the nasals, which extend to and are wedged in

* Zittel, K. A.. Textbook of Palaeontology, Eastman's Translation, vol. ii, pp. 217-222, 1902.

FIG. 1.



FIG. 1. *Tomistoma americana*. Superior and inferior view of the rostrum. Extreme tip restored to show the sockets for the large first teeth. The notch for the reception of the first mandibular tooth is but feebly developed. The nasals reach forward to and articulate with the premaxillaries. The sutures not sufficiently evident in the photograph are indicated by broken lines. One-third natural size.

between the backward extending premaxillaries, is distinctive, indicating that this form is to be referred to the family Tomistomidae.

Of the genera regarded as probably referable to the Tomistomidae only two are from America, namely *Thoracosaurus* Leidy and *Holops* Cope, both of which are from the upper Oretaceous. The type genus of the family, *Tomistoma*, is known in Europe from the Miocene of Hungary, Malta and Sardinia, and is represented at the present time by recent species found in Borneo, Sumatra and Molucco. From the

FIG. 2.

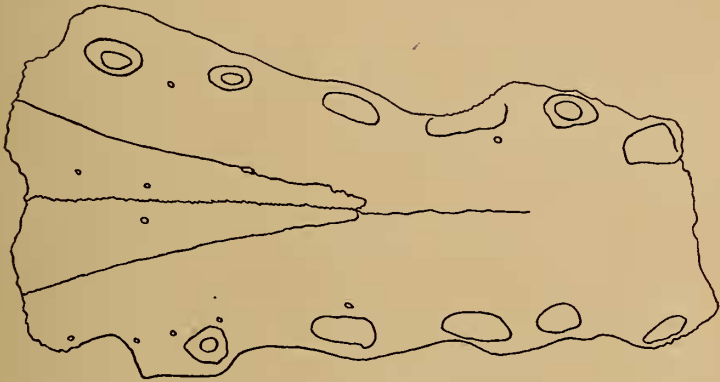


FIG. 2. *Tomistoma americana*. Fragment of the lower jaw showing that the splenials as well as the dentaries enter into the symphysis of the jaw. Specimen No. 2372. One-third natural size.

characters that can now be determined it appears that the Florida fossil is congeneric with these old world forms and accordingly the Florida species is referred to *Tomistoma*, this being the first record of the genus in America. The Florida material derives an added interest, from the fact that it affords evidence of the existence in North America of gavials as late as the Miocene or Pliocene, although the group has since disappeared from the Western Hemisphere. The species is clearly distinct from any heretofore described, and may be known as *Tomistoma americana*.

The writer is indebted to the officials of the National Museum, and especially to Mr. C. W. Gilmore, Assistant Curator of Reptiles, for facilities afforded in comparing related recent and fossil species.

Tomistoma americana sp. n.

The species *Tomistoma americana* is based upon the anterior part of a skull, including the rostrum, from the Bone Valley formation of Florida. The rostrum is much elongated and shows a very slight upward curvature. The teeth, of which the base or sockets of eleven are preserved, are sub-equal in size showing but slight differentiation. The premaxillaries extend on the dorsal surface of the rostrum to a point opposite the third maxillary tooth. The nasals are narrow and are wedged in between the backward projections of the premaxillaries, reaching forward to a point opposite the first maxillary tooth, the nasals and premaxillaries being thus in contact from the first to the third maxillary tooth, or a distance of 10^{cm}. The notch which should receive the first mandibular tooth is feebly developed being scarcely perceptible. The notch or constriction in the jaw which received the fourth mandibular tooth is, however, well developed. Five teeth are present in each premaxillary, the second, which has disappeared from the more specialized species of *Tomistoma*, being in this species well developed, although slightly smaller than the first, third and fourth premaxillary teeth. The first three maxillary teeth are strong; the fourth, however, is reduced and the jaw at this point is slightly constricted for the reception apparently of two strong mandibular teeth. Back of the fourth maxillary tooth the rostrum is again expanded, the fifth and sixth maxillary teeth being strong. Between these teeth is seen a distinctly marked pit for the reception of a mandibular tooth. The sockets for the teeth are directed forward. Although none of the large teeth are preserved, the crowns of young teeth may be seen in several of the sockets. These young teeth show keels. On the young first maxillary tooth the keels lack but little of being on the anterior and posterior sides of the tooth; while those of the fifth and sixth maxillary teeth are more nearly lateral in position. The type of the species is specimen No. 3657 of the Florida State Geological Survey collection.

With this specimen is associated a fragment of a lower jaw (No. 2372) which is probably of this species and accordingly may be designated as the paratype. This fragment on which is seen the sockets of six of the mandibular teeth is of interest since it shows that the splenial takes part in the mandibular symphysis, a feature common to the gavials, but exceptional among the alligators and crocodiles.